

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A packet switching apparatus comprising:
a plurality of lower layer processing units which are connected to
physical output ports, and each of which carries out a process for a data link layer
and a physical layer [[to]] for a packet;
a table storing flow data including a routing data and a search key; and
a processing unit ~~which~~ that searches said flow data from said table
based on a ~~search key of a~~ routing packet search key received via one of said plurality
of lower layer processing units[[,]] when said flow data for said search key of said
routing packet is registered on said table, and selectively transfers said routing packet
to one of said plurality of lower layer processing units based on said routing data of
said searched flow data wherein the transfer occurs without a microprocessor
routing process.

2. (Original) A packet switching apparatus according to claim 1, further
comprising a packet memory, and

wherein said processing unit stores said received packet in said packet
memory, and extracts said search key from said stored packet.

3. (Currently Amended) A packet switching apparatus comprising:
a plurality of lower layer processing units which are connected to
physical output ports, and each of which carries out a process for a data link layer
and a physical layer for a packet;

a table storing flow data including a routing data and a search key; and

a processing unit that searches said flow data from said table based on a search key of a routing packet search key received via one of said plurality of lower layer processing units when said flow data for said search key of said routing packet is registered on said table, and selectively transfers said routing packet to one of said plurality of lower layer processing units based on said routing data of said searched flow data according to claim 1, further comprising a processor carrying out a routing process of said routing packet in response to a routing process request to output said routing data, and

wherein said processing unit generates said routing process request to said processor, when said flow data for said search key of said routing packet is not registered on said table, and registers said routing data as a part of said flow data for said search key on said table such that said flow data is fully registered, when said routing data is outputted from said processor.

4. (Original) A packet switching apparatus according to claim 3, wherein said processing unit stores said search key of said routing packet in said table, when said flow data for said search key of said routing packet is not registered on said table.

5. (Original) A packet switching apparatus according to claim 1, wherein said routing data includes a port number specifying a physical output port, and

wherein said processing unit selects one of said plurality of lower layer processing units based on said port number of said routing data of said flow data for said search key of said routing packet, and transfers said routing packet to said selected lower layer processing section.

6. (Currently Amended) A packet switching apparatus comprising:
a plurality of lower layer processing units which are connected to
physical output ports, and each of which carries out a process for a data link layer
and a physical layer for a packet;
a table storing flow data including a routing data and a search key; and
a processing unit that searches said flow data from said table based on a
search key of a routing packet search key received via one of said plurality of lower
layer processing units when said flow data for said search key of said routing packet
is registered on said table, and selectively transfers said routing packet to one of said
plurality of lower layer processing units based on said routing data of said searched
flow data according to claim 1, wherein said routing data includes a port number
specifying a physical output port, and

wherein said packet switching apparatus further comprises a switch fabric connecting between said processing unit and said plurality of lower layer processing units, having an arbitration function and addressing said routing packet to said lower layer processing unit based on said port number.

7. (Previously Presented) A packet switching apparatus comprising:
a plurality of lower layer processing units which are connected to physical output ports, and each of which carries out a process for a data link layer and a physical layer for a packet;
a security unit carrying out encrypting and decrypting processes to a first packet based on a specific security data in response to encrypt and decrypt instructions to produce a second packet, respectively;

a table storing flow data including a search key, routing data and security data; and

a processing unit which searches a flow data from said table based on a search key of a routing packet received via one of said plurality of lower layer processing units in a packet memory, when said flow data for said search key of said routing packet is registered on said table and said flow data includes said security data, said search key including a destination address, transfers said security data of said searched flow data as said specific security data, said routing packet as said first packet, and one of said encrypt and decrypt instructions to said security unit, searches another flow data from said table based on a search key of said second packet from said security unit as a routing packet, when said another flow data is registered on said table, and selectively transfers said second packet to one of said plurality of lower layer processing units based on said routing data of said searched another flow data.

8. (Original) A packet switching apparatus according to claim 7, wherein said processing unit generates one of said encrypt and decrypt instructions based on said destination address, when said flow data for said search key of said routing packet is registered on said table and said flow data includes said security data.

9. (Original) A packet switching apparatus according to claim 7, wherein when said flow data for said search key of said routing packet received via said lower layer processing unit is registered on said table and said flow data does not includes said security data, said processing unit handles said received routing

packet as said second packet to search another flow data from said table based on a search key of said second packet.

10. (Original) A packet switching apparatus according to claim 7, further comprising a processor carrying out a security process for said routing packet in response to a security process request to output said security data for said routing packet, and

wherein said processing unit selectively generates said security process request to said processor based on said destination address, when said flow data for said search key of said routing packet is not registered on said table, and registers said security data as a part of said flow data for said search key of said routing packet on said table such that said flow data is fully registered, when said security data is outputted from said processor.

II. (Original) A packet switching apparatus according to claim 10, wherein said processing unit stores said search key of said routing packet in said table, when said flow data for said search key of said routing packet is not registered on said table.

12. (Original) A packet switching apparatus according to claim 7, further comprising a processor carrying out a routing process of said routing packet in response to a routing process request to output said routing data, and

wherein said processing unit generates said routing process request to said processor, when said flow data for said search key of said routing packet is not registered on said table, and registers said routing data as a part of said flow data for

said search key on said table such that said flow data is fully registered, when said routing data is outputted from said processor.

13. (Original) A packet switching apparatus according to claim 12, wherein said processing unit stores said search key of said routing packet in said table, when said flow data for said search key of said routing packet is not registered on said table.

14. (Original) A packet switching apparatus according to claim 7, wherein said routing data includes a port number specifying a physical output port, and

wherein said processing unit selects one of said plurality of lower layer processing units based on said port number of said routing data of said flow data for said search key of said routing packet, and transfers said second packet said selected lower layer processing section.

15. (Original) A packet switching apparatus according to claim 7, wherein said routing data includes a port number specifying a physical output port, and

wherein said packet switching apparatus further comprises a switch fabric connecting between said processing unit, said security unit and said plurality of lower layer processing units, having an arbitration function and addressing said second packet to said lower layer processing unit based on said port number.

16. (Previously Presented) A packet switching apparatus comprising:

a plurality of lower layer processing units which are connected to physical output ports, and each of which carries out a process for a data link layer and a physical layer to a packet;

a security unit carrying out encrypting and decrypting processes to a first packet based on a specific security data in response to encrypt and decrypt instructions to produce a second packet, respectively, and selectively transfers said second packet to one of said plurality of lower layer processing units based on routing data;

a table storing flow data including a search key, routing data and security data; and

a processing unit which searches a flow data from said table based on a search key of a routing packet received via one of said plurality of lower layer processing units in said packet memory, when said flow data for said search key of said routing packet is registered on said table and said flow data includes said security data, said search key including a destination address, transfers said security data of said searched flow data as said specific security data, said routing packet as said first packet, and one of said encrypt and decrypt instructions to said security unit together with said routing data.

17. (Original) A packet switching apparatus according to claim 16, wherein said processing unit generates one of said encrypt and decrypt instructions based on said destination address, when said flow data for said search key of said routing packet is registered on said table and said flow data includes said security data.

18. (Original) A packet switching apparatus according to claim 16, wherein when said flow data for said search key of said routing packet received via said lower layer processing unit is registered on said table and said flow data does not include said security data, said processing unit selectively transfers said second packet to one of said plurality of lower layer processing units based on said routing data of said searched flow data.

19. (Original) A packet switching apparatus according to claim 16, further comprising a processor carrying out a routing process of said routing packet in response to a process request to output said routing data, and selectively carrying out a security process for said routing packet based on said destination address of said routing packet in response to said process request to output said security data for said routing packet, and

wherein said processing unit generates said process request to said processor, when said flow data for said search key of said routing packet is not registered on said table, and registers said routing data and said security data from said processor as a part of said flow data for said search key of said routing packet on said table such that said flow data is fully registered.

20. (Original) A packet switching apparatus according to claim 19, wherein said processing unit stores said search key of said routing packet in said table, when said flow data for said search key of said routing packet is not registered on said table.

21. (Original) A packet switching apparatus according to claim 19, wherein when said flow data for said search key of said routing packet is not

registered on said table, said processing unit outputs said routing data and said security data as said specific security data from said processor, said routing packet as said first packet, and one of said encrypt and decrypt instructions to said security unit.

22. (Original) A packet switching apparatus according to claim 16, wherein said routing data includes a port number specifying a physical output port, and

wherein said security unit selects one of said plurality of lower layer processing units based on said port number of said routing data of said flow data for said search key of said routing packet, and transfers said transmission packet said selected lower layer processing section.

23. (Original) A packet switching apparatus according to claim 16, wherein said routing data includes a port number specifying a physical output port, and

wherein said packet switching apparatus further comprises a switch fabric connecting between said processing unit, said security unit and said plurality of lower layer processing units, having an arbitration function and addressing said second packet to said lower layer processing unit based on said port number.

24. (Currently Amended) A method of switching a routing packet comprising:

searching a table for a flow data based on a search key of a routing packet, said flow data including a routing data and said search key; and

transferring said routing packet to a physical output port determined based on a destination address of said routing packet[[],] when said flow data for said search key of said routing packet is registered on said table without a microprocessor routing process.

25. (Currently Amended) A method of switching a routing packet comprising:

searching a table for a flow data based on a search key of a routing packet, said flow data including a routing data and said search key; and

transferring said routing packet to a physical output port determined based on a destination address of said routing packet[[],] when said flow data for said search key of said routing packet is registered on said table according to claim 24, further comprising:

registering said search key on said table when said flow data for said search key of said routing packet is not registered on said table;

carrying out said routing process of said routing packet, when said flow data for said search key of said routing packet is not registered on said table; and

registering said routing data as a part of said flow data for said search key on said table such that said flow data is fully registered.

26. (Previously Presented) A method of switching a routing packet comprising:

searching a table for a flow data based on a search key of a routing packet, said flow data including said search key, routing data and security data, and said search key including a destination address;

selectively generating one of an encrypt and decrypt instruction based on said destination address;

carrying out one of an encrypting process or a decrypting processes to said routing packet based on said security data in response to said generated instruction, when said flow data for said search key of said routing packet is registered on said table and said flow data includes said security data, to produce another routing packet;

outputting said another routing packet as a transmission packet to a physical output port.

27. (Original) A method according to claim 26, further comprising:

outputting said transmission packet to a physical output port based on said searched routing data.

28. (Original) A method according to claim 26, further comprising:

searching said table for a flow data based on a search key of said transmission packet; and

transferring said transmission packet to a physical output port determined based on a destination address of said transmission packet when said flow data for said search key of said routing packet is registered on said table.

29. (Original) A method according to claim 26, further comprising:

when said flow data for said search key of said routing packet is registered on said table and said flow data does not include said security data, selectively transferring said transmission packet to said physical output port based on said routing data of said searched flow data.

30. (Original) A method according to claim 26, further comprising:
 - generating a process request, when said flow data for said search key of said routing packet is not registered on said table;
 - carrying out a routing process of said routing packet in response to said process request to output said routing data;
 - selectively carrying out a security process for said routing packet based on said destination address of said routing packet in response to said process request to output said security data for said routing packet; and
 - registering said routing data and said security data as a part of said flow data for said search key of said routing packet such that said flow data is fully registered.
31. (Original) A method according to claim 30, wherein said registering includes:
 - registering said search key of said routing packet in said table, when said flow data for said search key of said routing packet is not registered on said table.